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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Nitrogen Market

IN our market intelligence last week it was announced that the price of neutral sulphate of ammonia (20·60 per cent. nitrogen), for delivery in six ton lots carriage paid to buyer's nearest station, had been fixed by British makers at £6 10s. per ton up to June of next year. One has only to compare this figure with the prices ruling a few years ago to realise the tremendous fall that has taken place in sulphate prices. In 1919-20 the average price per ton, home and export, of neutral sulphate (25½ per cent. ammonia as it was then described) was £23 15s. 3d. By 1924-25, when the term "21·1 per cent. nitrogen" was introduced, the price had fallen to £12 5s. 6d. Since then it has steadily declined to the present figure of £6 10s. Thus, within a period of eleven years, the price of sulphate of ammonia has fallen to a little more than one-fourth of the selling price in 1919-20. We have no detailed figures relating to nitrate of soda prices, but as the nitrogen standard in fertilisers may almost be likened to the gold standard, these have undergone an approximate decline. It is obvious that even with very cheap production the reduction to £6 10s. a ton drastically reduces the profit margin, and in the case of by-product works, where the production methods and costs have undergone no fundamental change, it may be a question whether there is any profit left at all. In any case, with costs remaining about stable, a decline from £23 odd to £6 10s. per ton is sufficiently serious. If £6 10s, per ton still leaves a profit, then production of sulphate in the first few post-war years must have been a highly profitable business.

There can be no doubt at all that the enormous output of the synthetic product is, apart from the present industrial conditions throughout the world, mainly responsible. Not only in this country but in many others large synthetic ammonia works have been set up, and although up to recently consumption continued to increase generously, it failed to increase as rapidly as production. Here, then, is another example of the effects of over-production in a market not as healthy as it was a few years ago. It always seemed obvious that if production moved faster than consumption a point must be reached when production would have to be checked. That, in fact, has now been reached, and the remedy seems to lie in the rationalisation of output and the regulation of prices. That, no doubt, was the object of the nitrogen conferences that have been held recently—so far without definite result.

It still remains true that the potential use of nitrogen in agriculture is almost without limit, and that there is immense scope still for its profitable employment. But the agriculturist—usually a slow-moving creature—requires to be educated in the nitrogen habit, and then he must be sufficiently in funds to undertake the purchase. The return on expenditure is sure, but expenditure of any kind in the present condition of agriculture is not popular. So, although the ultimate future of the nitrogen industry may be quite safe, the immediate future is a little troublesome, and we shall have to wait for recovery with patience, infused with confidence. The world depression has had a marked influence on the leading fertiliser concerns. The German 7 per cent. Potash Loan, which not so long ago stood at £107, is now about £80. The Cosach 7 per cent. bonds, secured on the Chilean nitrate industry, have fallen from the issue price of £96 to about £85. Imperial Chemical Industries, whose shares at one time reached 46s., and who owns the great works at Billingham-on-Tees, has experienced a heavy decline on the Stock Exchange. These drops, of course, are part of a general downward movement, and when revival returns such investments should equally share in the upward tendency.

The Return to Economy

THE return to economy is proceeding in a steady, normal, English way, in perfect keeping with the size of the problem involved and its serious nature. It is above all necessary to avoid excitement and panic causing a loss of confidence which, however disastrous

in other nations, would be fatal in Britain. We live on the universal confidence in our stability, and we must proceed in grim quiet earnestness to keep that quality intact. The wave of economic understanding now sweeping the country began last autumn with "Account Rendered (1900–1930)," an arresting volume by Sir Ernest Benn, which did no more than set out the facts and call attention to the situation. The economy campaign of last spring was the second step. It went no further than to say that there must be a complete cessation of new public expenditure. Now comes the May report, the third step, which in cold official phraseology tells us that we are £120,000,000 short on the next Budget, and that drastic cuts all round must be made at once.

It is the bounden duty of the business man to read the report from cover to cover. The specific recommendations made and the actual figures given are of less real importance than the picture the report presents of the wild extravagance and complete economic irresponsibility in public affairs. But the report goes further, and makes clear the crimes of the immediate past in putting burdens upon the future.

Perhaps the most useful part of this volume of exposure of political folly is the Minority Report, in which two Socialists express almost complete disagreement with the conclusions reached. These gentlemen first of all ignore the facts and figures with which the report opens. They then proceed to rehash the weary verbiage of Socialism, and when they condescend to come down to a figure, give us perfect proof of the diabolical power of mathematics misunderstood and misapplied. One illustration will suffice. Putting the national income of 1913–14 at £2,300,000,000, and that of 1929–30 at the optimistic figure of £4,000,000,000, public expenditure is calculated by these quack statisticians at 7·4 per cent. of the national income in the former year and 18·93 per cent. in the latter. This is represented as an increase of 11·53 per cent., and further manipulation of the same kind reduces social services to 1·41 per cent., a figure of which no doubt a great deal will be heard on Socialist platforms in the next few months. The answer—which is that 18·93 per cent. is not 11·53 per cent. but 255·8 per cent. higher than 7·4—is not likely to appeal to people who can argue in this way. Needless to say, the minority recommend further inquiry, more committees, "careful scrutiny and supervision," and the setting up of "joint negotiating machinery"; they claim that instead of going into bankruptcy, we are only "remodelling" and "replanning" the economic and social structure of the country. To do them justice, these two Socialists are unable to avoid the conclusion that expenditure on education is too high, and that teachers' salaries must be cut by 12½ per cent., a very striking confirmation of the conclusions of the main report.

Some Results of Jubilee Week

On all sides one hears favourable impressions of the results of the various meetings held during the recent chemical jubilee week in London. Such meetings are always beneficial even when confined to home delegates; they provide an agreeable opportunity for personal "contacts" that would otherwise be impossible and for the exchange of information and experience. When such meetings become international, as the recent one largely was, the advantages are greatly multiplied and the benefits proportionately enlarged. It was particularly fortunate that so many American friends should be present during the most acute stage of the European crisis and should be able to judge the situation for themselves. Their influence, one may be sure, when they return, will tend to strengthen the feeling that President Hoover's proposals were not only finely conceived from the world point of view but constitute sound policy for the United States itself.

As we were able to announce last week, one important step was the scheme for co-operation between the chemical plant manufacturers of Great Britain, France and Germany. French and German scientists and industrialists visited the Exhibition of British Chemical Plant, and it has been provisionally agreed that future exhibitions of this nature in the three countries shall be organised and advertised in close collaboration. Each country will take its turn triennially. France will hold her next exhibition in 1932, Germany will follow with "Achema" in 1933, and the exhibition will again be held in Britain in 1934. The representative organisation in each country dealing with the manufacture of chemical plant will be responsible for organising parties to visit the exhibitions held in the other countries. This is an excellent piece of work.

Already Mr. Davidson Pratt, whose Association organised the exhibition, is looking to the future. According to a circular just issued, the managing committee are anxious to obtain the views of the exhibitors in order that the experience gained may be made available for future use. It would be of particular assistance if exhibitors would give some indication as to the value of the exhibition to them from the point of view of orders and inquiries received, and would submit constructive suggestions. It is the intention of the managing committee to collate the replies to these questions and in the early autumn to call a meeting of all the exhibitors to discuss the points raised and, in particular, to settle future policy. The total attendance at the exhibition, we now learn, was 3,500 (250 representing the general public), and over 4,000 catalogues were issued, of which some 500 were sent to foreign industrialists who were unable to attend.

Books Received

An Introduction to Organic Chemistry. By John Read. London: G. Bell and Sons, Ltd. Pp. 366. 6s. 6d.

Nitrocelluloseesterlacke und Zaponlacke. By Dr. Fritz Zimmer. Leipzig: S. Hirgel. Pp. 225. 16.50.

The Calendar

Sept. 6–12	International Association for the Testing of Materials: First Congress.	Zürich.
Sept. 14–15	Institute of Metals: Annual Autumn Meeting	Zürich.
23–30	British Association Centenary Meeting.	London.
23–30	Faraday Centenary Celebrations	London
27	Eleventh Congress of Industrial Chemistry.	Paris.
Sept. 29–Oct 2	Iron and Steel Institute: Autumn Meeting.	Swansea.
Nov. 16–21	Third International Conference on Bituminous Coal.	Carnegie Institute of Technology, Pittsb'gh.

British Association Centenary

Programme of the Chemistry Section

THE Centenary Meeting of the British Association for the Advancement of Science will be held in London from September 23 to 30, 1931. From the point of view of the Chemistry Section, the importance of the meeting will be greatly enhanced by the arrangements that are being made by the Royal Institution to celebrate at the same time the centenary of Faraday's discovery of benzene, a compound that has become of the greatest utility, not only as a motor fuel, but as one of the most important raw materials for the organic chemical industry.

Faraday Celebrations

The Faraday celebrations will include an exhibition in the Albert Hall to demonstrate the remarkable industrial developments that have accrued from Faraday's fundamental studies in the electrical and chemical fields. One fifth of the total space will be devoted to the chemical aspects of his work, the rest being allotted to his electrical discoveries. Faraday's discoveries in many branches of chemistry and physics were so numerous and fundamental that it is difficult to determine which was the most important, but the exhibition, by dealing with his main investigations, will constitute a remarkable demonstration of the manner in which new industries have arisen from his researches, which, in the realms of chemistry, include the liquefaction of gases, alloy steels, electrolysis, catalysis and benzene. Very appropriately, Sir Harold Hartley will devote his presidential address to the Chemistry Section to Michael Faraday, with particular reference to the developments in the theory of electrolysis and electrolytic conduction which have originated from Faraday's pioneering work on this subject.

The remainder of the programme will take the form of four discussions and the first of these will immediately follow the presidential address. Professors P. Debye (Leipzig), N. J. Bjerrum, J. N. Brönsted (Copenhagen), K. Fajans (Münich), J. C. Philip and S. R. Milner and Sir Harold Hartley have promised to speak on "The Influence of the Medium on the Properties of Electrolytes."

Chemistry of the Vitamins

The morning and afternoon of Friday, September 25, will be devoted to a discussion on "The Chemistry of the Vitamins and Related Substances," which will be introduced by Sir Frederick Gowland Hopkins, the President of the Royal Society. Those taking part in the discussion on "The Chemistry of Vitamin A and the Carotinoids" include Professors P. Karrer (Zürich), H. von Euler (Stockholm), R. Kuhn (Heidelberg), J. C. Drummond and I. M. Heilbron, Drs. R. A. Morton and T. Moore. In connection with "The Chemistry of Vitamin B and related problems," the speakers will be Professors B. C. P. Jansen (Amsterdam) and R. A. Peters, while "The Chemistry of Vitamin D and related Sterols" will be discussed by Professors A. Windaus (Göttingen) and I. M. Heilbron and Drs. R. Bourdillon and O. Rosenheim. Professor R. Robinson (Oxford) will sum up the discussion.

On September 28 the section will hold a symposium on "The British Fuel Problem" to which contributions on coal, oil and future possibilities will be made by distinguished authorities in these particular fields. The object of the symposium is to present the British fuel problem in simple and non-technical language for the benefit of the general public, in order that they may have an opportunity of learning the correct facts of the case and of rectifying any false impressions that may have arisen from the mass of misleading information which has been written and published on this subject.

The final discussion will be on "The structure of simple molecules." This will be introduced by Professor P. Debye, who will also quote the evidence from X-ray measurements. The other speakers will be Professor J. E. Lennard-Jones ("Evidence from molecular spectra"), Mr. R. H. Fowler ("Quantum mechanical theory of valency"), Professor V. Henri of Marseilles ("Predissociation: structure of some special molecules"), Professor F. G. Donnan and Mr. C. N. Hinshelwood.

Chemical Exhibits

Special exhibits will be on view during the meeting; those already arranged are by Dr. R. C. Menzies (illustrating the chemistry of thallium), Professor C. S. Gibson (illustrating some recent investigations of the chemistry of gold) and Professor H. V. A. Briscoe (illustrating the chemistry of rhenium). Further exhibits will be welcomed and should be submitted to Professor C. S. Gibson, Guy's Hospital, Medical School.

On Saturday morning, September 26, there will be a visit to the Research Laboratories and Works of the Gas Light and Coke Co. at King's Road, Fulham, followed by a lunch given by the Governor and Directors of the Company at the Head Office, Horseferry Road.

The above outline should suffice to indicate that the Chemistry Section will have a most interesting and instructive session and may be of assistance in securing greater participation in the proceedings of the British Association on the part, not only of chemists and chemical industrialists, but also of that section of the public which desires to keep in touch with the latest developments of science. Membership of the British Association is open to anyone. The subscription is a very modest one and the meetings of the various sections to which every member has free access afford a unique opportunity of meeting the research workers, and of discussing the problems with the greatest authorities, in the various fields of science.

Benn Brothers' "Good Record"

The Times City Notes on Saturday contained the following reference to the report and balance sheet for the year ended June 30, 1931, of Benn Brothers, Ltd., publishers of THE CHEMICAL AGE and numerous other well-known trade and technical journals:—

"Another good report is issued by Benn Brothers, Ltd., the well-known publishers of trade papers. The accounts for the year to June 30 reveal a further slight increase in net profits at £49,394, and after again placing £10,000 to reserve the Ordinary shareholders for the third year receive a dividend of 20 per cent. Evidently, therefore, if the depression has exerted an influence on the business it has done no more than check the rate of expansion, and few are the fortunate enterprises of which this can be said for the past year. The report states that the circulations and advertisement revenues of the company's publications have been well maintained, and also refers to the company's agreement with the Federation of British Industries to publish a new monthly review for the benefit of the Spanish-speaking markets. This development is an outcome of the representation of the company at the British Empire Trade Exhibition at Buenos Aires. The general reserve now amounts to £55,000, and other funds bring up the total reserves to £66,350, exclusive of the 'carry-forward' of £15,612. The floating assets amount to £73,400, while the current liabilities are about £60,000. The company has a good record, for during the past decade the Ordinary dividend has never been less than 17½ per cent., while four years ago shareholders received a bonus of 50 per cent. in Preference shares."

Research Activities in Canada

SCIENTIFIC and industrial research in Canada is now being carried on by a number of Government and other organisations including the National Research Council of Canada at Ottawa, the Dominion Experimental Farms, the Dominion Department of Mines, the Forest Products Laboratories, the Ontario Research Foundation and the Research Council of Alberta. The activities of the various Associate Committees and of the assisted researches initiated or financed by the Dominion Research Organisation are outlined in the 13th Annual Report of the National Research Council of Canada, a copy of which can be consulted at the Office of the High Commissioner of Canada, Canada House, Trafalgar Square, London, S.W.1.

"Cosach" Accounts

THE first balance sheet of Compania de Salitre de Chile (Cosach), which was formed in 1930 for the purpose of consolidating in one enterprise the nitrate industry of Chile, shows total assets of $758,385,306. Nitrate reserves of 103,503,000 tons in private lands are valued at $220,367,593, and reserves of 150,000,000 tons in Government nitrate deposits as to which the company has been granted right to obtain delivery for exploitation are valued at $319,364,062. Current assets of $85,932,546 include cash totalling over $33,090,000.

"Safety First" in the Cleaning and Repair of Tar Stills

By H. C. Dungey

We give below the text of a paper by Mr. H. C. Dungey, of The Yorkshire Tar Distillers, which was presented at the recent National Safety First Congress at Leeds.

FROM the earliest days of the tar industry the necessity for cleaning and repairing the stills has presented various problems to the tar distiller, not the least of which is the difficulty of carrying out these operations under safe conditions.

The usual type of tar still is an upright cylindrical vessel with a domed top, fixed in a brickwork setting and heated by fire, usually a coal or coke furnace, but sometimes oil or gas fired. The bottom is convex inside and is attached to the sides by a channel, the size and shape of which varies with the requirements of different tar distillers and the ideas of still makers. Various mountings are fitted to the stills, the more important of which form the point of view of the present discussion are (1) the swan-neck fitted to the top of the still to carry the vapours to the condenser, (2) the charging pipe for the introduction of crude tar, (3) the run-off pipe for discharging the pitch, and (4) a manhole in the top to permit access for cleaning.

When the volatile constituents are distilled off from a charge of tar, a large quantity of pitch remains in the still, and after cooling a certain time, the outlet tap attached to the tail pipe is opened and the pitch run off into the pitch cooler. Owing to the sedimentary nature of tar and the action of heat during distillation a certain amount of scale and free carbon always remains in the still. The small amount of pitch left behind after running off is also liable to be coked by the heat from the furnace brickwork, and adds to the deposit left in the still. It is therefore necessary after a certain number of charges to open out the still and remove the residue and dirt. After the pitch from the last charge is run off, the still is steamed out, cooled and ventilated. Workmen then enter the still and scale off the deposit by means of picks and chipping hammers.

Risks in Cleaning Tar Stills

The special risk met with in cleaning stills are (1) fire or explosion, (2) gassing, (3) sickness resulting from inhalation of poisonous fumes in quantities insufficient to produce actual gassing effects, and (4) injuries resulting from the contact of corrosive or irritating substances with the skin.

In the case of tar stills, the chief risk is undoubtedly that of gassing. During the process of distillation various noxious gases are evolved. These being generally heavier than air remain in the still after the pitch is run off. The gas most usually encountered is sulphuretted hydrogen (H_2S) which is poisonous in minute quantities. The Chemical Works Regulations require that the still shall be inspected and certified by a responsible person before any person enters the same. These regulations are amplified in the procedure prepared and approved by the Association of Tar Distillers and the Association of British Chemical Manufacturers, the chief addition being that the responsible person before certifying that the still is safe to enter shall carry out a further test by introducing a cage of white mice. This is a most valuable precaution; if the mice remain normal for five minutes it is a certain indication that the atmosphere is safe where they are. After making his examination and test, the responsible person must certify that the still *is*, or that it *is not*, isolated and free from danger. If it is not free from danger a man may only enter with a breathing apparatus and life-line.

Preparing the Still for Entry

To prepare the still for examination prior to cleaning, it must first be steamed out to expel foul vapours, etc. The usual practice is to break the manhole about half an hour after running off the last charge of pitch, and introduce steam by means of a flexible pipe, the manhole being loosely covered by sacking. A more efficient method is to turn steam into the still through the perforated steam pipe in the channel, immediately the pitch is run off and before the manhole is broken. The steam, together with the vapours removed from the still, pass through the condenser in the usual way. When oil ceases to come over, steam is shut off and the manhole broken. The still is then isolated from the charging pipe and steam main, the swan-neck is disconnected from the condenser, and the tail pipe from the pitch cooler, either by actually breaking the joints or by the insertion of blanks. The better practice is that the joints should be completely broken.

These are most important precautions. In the past many accidents, frequently fatal, have occurred through vapours from a still which was working finding their way through receivers and condensers into stills which were being cleaned.

The "Tally" System

A convenient method of carrying out safety regulations is in use at certain works and is known as the "tally system." The "tally" is a small wooden panel marked "Tally" safety first—be sure all disconnections are complete. Return this tally to foreman each night." The foreman, after inspecting the still and finding it safe, fills in a certificate with the number of the still, the name of the man and the date, signs it, and attaches it to the tally. The workman then takes the tally to the still with him and must return it to the foreman each night. If the work is to be continued next day a new certificate must be made out. The counterfoils of the certificate constitute the "record book" in accordance with the regulations.

Importance of Bottom Manholes

An important improvement in the construction of tar stills introduced during recent years is the provision of a bottom manhole. The tail pipe is enlarged to about 18 in. diameter and is closed by a flat plate to which the run-off tap is fixed. On removal of the top and bottom manhole a through current of air is set up which thoroughly ventilates the still and makes gassing practically impossible. The still also cools more rapidly and cleaning can be carried out much more quickly, since the dirt can be thrown out at the bottom instead of having to be drawn through the manhole with bucket and rope. The advantages of a bottom manhole from the safety point of view were very forcibly demonstrated a few weeks ago when an accident occurred at a Scottish tar distillery. It appears that a man who had been told to remove the top manhole in order that the foreman might inspect the still, exceeded his instructions and entered the still. He was overcome by gas and became unconscious before he could escape. Three other men successively entered the still to rescue him, but were all immediately gassed. The bottom manhole was removed with great haste by another man, and all four men were rescued in an unconscious condition. They were removed to a local infirmary, but were found very little the worse for their experience and were discharged the next day. There is not the slightest doubt that the bottom manhole of the still saved the lives of the four men concerned. It would have been impossible to remove four unconscious men through the top manhole of the still before it was too late.

With regard to the use of breathing apparatus and lifebelts in stills which are not free from gas, there are a number of excellent devices on the market for the purpose. One of these should be kept in every tar works for use in emergency. The class of apparatus which supply air to the helmet from an outside bellows or pump are to be preferred to those face masks which depend on inhalation for the supply of air. All such safety apparatus should be in charge of one man, whose duty it should be to see that it is kept in perfect order and available for instant use in case of emergency.

General Precautions Necessary

With regard to the risk of fire or explosion in still cleaning operations, if the stills are ventilated and made free from gas there is obviously no danger of explosion. The various regulations regarding the use of portable electric lamps should be carefully observed. It is very desirable that lamps worked from the main supply should be connected by armoured leads and that the metal parts of the lamp should be earthed in accordance with Board of Trade rules.

The chief danger of injury from corrosive substances is, in the case of cleaning tar stills, the action of the fine dust and particles of hard pitch on the eyes. This dust is most irritating, and sets up an inflammation and swelling of the eyelids which often lasts for several days. The use of goggles during

the actual still-cleaning operations is therefore essential if this risk is to be avoided, and their use should be made compulsory. It is often found that certain men are specially liable to contract various forms of skin disease by contact with dust and other substances which do not affect normal persons.

In this connection it should be stressed that general attention to cleanliness is of the utmost importance in avoiding all forms of skin affection. Suitable washing places with a supply of soap and clean towels are provided in all tar works. All men concerned in still cleaning should be required to make use of these facilities.

"Leading the Blind"

An Earnest Voice from Australia

To the Editor of THE CHEMICAL AGE.

SIR,—Although the imperial ukase has gone forth, "this correspondence is now closed," I am relying on distance to plead for me, when asking you to insert the following contribution to the discussion headed "Leading the Blind," which I read with mixed feelings. First, allow me to say I am English, Devonshire born, though my residence in this great country dates back 40 years. Secondly, I am Labour and Socialist at heart and for the space of 20 years both voted and worked for the Australian Labour Party, leaving them in 1916 on the Conscription issue.

My apologies are offered to your readers for the mention of these personal details, my object in doing so is to show Mr. Gillian that my sympathies are with the working class, being indeed included therein under "technicians," viz., a chemist. Neither Mr. Gillian nor yourself can have had much experience of State ownership, but this epistle voices the opinion of one amongst millions of Australians living in a Government-ridden land, all of whom have first-hand information.

Mr. Editor, send Mr. Gillian here on a visit, let him inquire into State enterprises past and present, and you need fear no more advocacy of State ownership, if the gentleman is as honest and intelligent as appears from his letters. There would be no need for discussion; balance sheets speak louder than words.

Mr. Gillian writes, "State ownership of monopolies has in the course of years proved its value to the community in protecting it against plunder by vested interests and also in creating co-ordinate order against competitive chaos." This statement is diametrically opposed to the facts. State ownership has plundered the workers for the benefit of a privileged class. As for "competitive chaos," this is merely what Australians call "eyewash" for the unthinking herd. State ownership has been tried in the following industries amongst others: Trawling, brickworks, coal-mining, road metal, meat works, butchers' shops, cattle raising, dockyards, farming, mining, ship-building, tramways, and railways, etc. Each and everyone has been a ghastly failure; whatever the State has touched has withered as if blighted.

Most of these activities have been scrapped, the revenues of the State being insufficient to continue them at a dead loss, this despite the fact that in several of them the State held an absolute monopoly. Usually the closing down was attended by a horrid smell and dreadful insinuations.

The railways are perhaps the only ones remaining of any importance, and to the Government ownership of these Australia largely owes its present lamentable position. As you are aware, we are "up against it" with an enormous deficit, and this deficit curiously enough, is largely "earned" by our railways. All railways here are State-owned. If ever there was a chance for State ownership to make good, here was the opportunity, starting as it were from scratch about 80 years ago, with an absolute monopoly, unlimited capital and the goodwill of the whole nation. This last is most important, as disposing of any active or latent opposition from dispossessed vested interests.

"A State department can perform its services with as great intelligence as a private concern." If this were broadcasted over Australia, the shout of derisive laughter would be heard in England. Being aware that this is no argument, I merely ask, that, if this is correct, "Why have they never done so?"

For downright stupidity (red tape) and waste, any Government department whatever is a beautiful illustration. It cannot be otherwise, for the whole service is ruled and governed by regulations and seniority.

The result is that each official is afraid to act on his own initiative; he has to consult the regulations, perhaps dozens of them, refer to a superior, who repeats the process, and perhaps gets his answer weeks after the opportunity has passed.

Perhaps your correspondent does not know that the only promotion is by length of service, and this by order of the Labour Unions. The result of this is that men arrive at positions for which they are quite unfitted, drawing hundreds a year, where they are not worth tens. Again, no one in the service has any interest in their work; they cannot be discharged, they cannot get promotion except by the death or retirement of a superior, hence rot and decay, for no one cares.

The railways are a standing disgrace to Australia, and remember there are six States and the Central Government, all owning railways, and each one is in the same parlous condition, so it is not an isolated instance but inherent in the ownership. At least half the hands could be discharged without any detriment to the efficacy of the service. Any Australian can give you chapter and verse for this.

Australia is all right, the finest country on God's earth, but politics are rotten and this directly follows from State ownership. Political parties are, as everywhere, fairly evenly balanced with a mass of voters on the centre of the see-saw, rushing first one way and then the other, as they think their particular interests warrant. This mass is composed of State servants who in the aggregate with dependents, etc., amount to about one-sixth of the voters, and here follows a concrete and recent example of the result.

The Liberal party in this State finding itself getting into the financial mud, made an honest effort to make ends meet and put hours back to 48 per week and reduced wages 1s. 8d. in the pound. Unfortunately they were foolish enough to go to the country, and the Opposition, led by the lamentable Mr. Lang, made an election cry of 44 hours and restoration of the docked wages. He won. The hours have been reduced, but he finds it impossible to find the money to restore wages, which will now have to be reduced 4s. in the pound. Incidentally this 44 hours added a few hundred thousand pounds to the railway deficit.

If ever the State gets its hands on the I.C.I., Mr. Gillian, good-bye to your job and that of the 50,000 workers now employed.

After seeing at first hand the result of State Socialism in Australia, one is forced to the conclusion (and in my own case against my will, for at one time I stood just where Mr. Gillian stands) that the solution of the problem lies in some form of profit sharing. It could easily be done; the coal-miners of N.S.W. wasted enough in a year-long strike to buy all the mines.

No. Mr. Gillian, the sooner you and other leaders realise that two factors enter into production, brains and brawn, and that the greater of these is brains, the sooner will the "noise and shouting" die down, and we shall be free to solve the problem, for it can be solved, but never by any form whatever of State control.—Yours sincerely,

AN OVERSEAS BRITON.

Sydney, N.S.W.

British Industries Fair

OVER two-thirds of the space available in the British Industries Fair, to be held in London and Birmingham next February, had been applied for by July 25. At Castle Bromwich, Birmingham, where the buildings are being extended to give a total exhibiting area of 250,000 square feet, 80 per cent. of that space was let. At the White City, London, where the new textiles section is to be held, the original area of the section has been increased from 40,000 to 80,000 square feet, of which nearly 70 per cent. was let; while in the main London section at Olympia, despite the transferring of textiles and clothing to the White City, the bookings amounted to over 50 per cent. of the available area, or more than at the corresponding stage last year. The large amount of space let seven months ahead of the opening date indicates how much manufacturers have come to value the Fair as part of their sales organisation. The Fair will open in London and Birmingham simultaneously on February 22.

Conversion of Coal into Oil

Views Expressed by Professor F. G. Donnan

PROFESSOR F. G. DONNAN, of University College, London, is convinced that the security and future prosperity of this country urgently demands the erection and operation of large-scale plant for the conversion of coal into oil. In a recent letter to *The Times*, July 31, he points out that we possess sufficient knowledge and experience to justify this project, and puts forward a plea for assistance from the Government in starting a new industry to utilise our great national asset—coal—and to relieve unemployment.

The Billingham Plant

During the last five or six years the hydrogenation of British coal has been very carefully investigated at the Billingham Works of Imperial Chemical Industries, Ltd. "This process," says Professor Donnan, "has been closely investigated in a plant capable of treating 20 tons of coal a day, and I have had the privilege of being in general touch with this work. It has demonstrated the commercial feasibility of manufacturing high-grade petrol and other oils from British coals, and has shown that petrol of a quality equal, if not superior, to the finest natural motor spirit can be produced at a cost of about 7d. per gallon.

"Though the 20-ton plant—referred to as in operation at Billingham—cannot be regarded as a commercial unit, surely the point has now been reached at which commercial production is justifiable, and should be taken up in the national interest. Let us consider, for example, a plant capable of treating 1,000 tons of coal a day, and producing 213,000 tons of petrol annually from British coal. As a fair estimate, let us assume that each ton of coal hydrogenated would produce 60 per cent. of its weight in petrol. We must remember, however, that coal is also required for the manufacture of the hydrogen, and for the production of the steam and electric power required in the process, making four tons of coal necessary for each ton of refined petrol. The plant envisaged would therefore require about 850,000 tons of coal per annum. It has been calculated by experts that a plant of this character would give permanent employment to 5,000 men, of whom 3,000 would be miners, in addition to the employment during the construction period of some 17,000 men for, say, two years.

Flexibility of the Hydrogenation Process

"The flexibility of the hydrogenation process is such that the plant could be employed to produce petrol only, to produce petrol, Diesel engine oil, and fuel oil in various proportions, or to hydrogenate various types of tar with a yield of petrol approaching 80 per cent."

Referring to the commercial utilisation of this "oil from coal" process, Professor Donnan is of the opinion that we could slowly and gradually build up an industry that would completely cover our national requirements for *all* classes of fuel. Putting this at 10,000,000 tons per annum it is said that expert calculation indicates an annual consumption of about 30,000,000 tons of coal, the heavier oils requiring less hydrogen than petrol. This industry, moreover, should give permanent employment to about 90,000 at the works and 100,000 men at the mines. Great Britain would then be completely independent of foreign supplies of motor spirit and fuel oil, and the building up of such an industry would be of enormous benefit to many ancillary industries, particularly iron, steel and engineering.

Criticism by Professor J. S. S. Brame

Commenting upon these views, Professor J. S. S. Brame, of the Royal Naval College, Greenwich, in a further letter to *The Times*, August 5, is of the opinion that Professor Donnan has omitted to mention several important considerations which are vital to the economic success of this process in relation to other processes for attaining the same ends. "In the first place," he says, "no information has been made public of the capital costs, life, and depreciation of such plants in relation to the throughput of material a day, but they are unquestionably very high. The plant works at 2,500 lb. to 3,000 lb. pressure per square inch and about 460-480° C. The fuel and oil paste has to be pressed in continuously and the hydrogen supplied under these high pressures. When Professor Donnan proposes a plant to treat 1,000 tons of coal a day has he any idea of the capital cost?

"Further, there is the cost of hydrogen, a difficult figure to arrive at. In the report of the Nitrogen Products Committee (1920, p. 245) it is stated that under pre-war conditions by means of a process such as the water gas catalytic process it would amount to 2s. 6d. per 1,000 cu. ft. delivered under compression. While hydrogen of such purity as here referred to would not be required, in post-war days it is very unlikely that a cost less than 1s. per 1,000 can be assumed, even from the gases obtained in the process. As 10 cu. ft. of hydrogen are required per lb. of coal, the hydrogen cost would be over 22s. per ton of coal. Fuel experts will also be surprised to learn that each ton of coal would produce 60 per cent. of its weight in petrol, approximately 150 gallons per ton, and would like to know whether this was from a bituminous coal and in a commercial plant; further, whether the figure of 7d. a gallon as the cost of production is inclusive of charges on capital, depreciation, etc., or merely production cost.

"There is no question about the direct hydrogenation of coal producing a far higher yield of liquid fuel products than any other process, and in Germany great expectations were based on the process. Yet it has been practically abandoned in favour of hydrogenation of tars produced by carbonization—material much more amenable to treatment. It is still a matter for investigation whether this second step is worth while in view of the high first costs and operating expenses of these high-pressure plants. Investigations on these lines are being carried out in this country, and it has been announced that some £35,000 is to be allocated for plant and about £8,000 per annum for staff, etc."

Cellulose Acetate Silk Co., Ltd.

Increased Demand for Cellulose Acetate Anticipated

IN the course of his speech at the third annual ordinary general meeting of Cellulose Acetate Silk Co., Ltd., held at the King's Arms Hotel, Lancaster, on Friday, July 31, Sir J. Donald Horsfall, Bt., the chairman of the company, who presided, said that there are at present definite indications that cellulose acetate is likely in the near future to be in commercial demand for a variety of purposes other than the manufacture of artificial silk, and the directors are exploring every channel to find a further outlet for this product. During the year improved methods of working the acetate plant have been effected, which, combined with certain alterations and modifications now in course of completion, have considerably increased the capacity of the original 4-ton plant, and will reduce the cost of production.

Making reference to the writ which has been received from British Celanese, Ltd., for infringement of patents, Sir J. Donald Horsfall said that his company have long previously sought advice from counsel and technical experts, and have in fact been advised that the company need have no fear in carrying on their present manufacture.

Ramsay Memorial Fellowship Trust

THE Ramsay Memorial Fellowship Trustees have made the following awards of new Fellowships for the year 1931–32:

Mr. B. K. Blount, B.A., B.Sc., Dr. Phil. Nat., a Fellowship of £300, tenable for two years, at the University of Oxford.

Mr. Ragnar Ericson, civil engineer, a Swedish Fellowship of £300, tenable for two years, at the Imperial College, London.

Dr. George Karagunis, a Greek Fellowship of £400, tenable for one year, at University College, London.

Dr. J. Lens, a Netherland Fellowship of £300, tenable for two years, at University College, London.

Dr. Y. Urushibara, a Japanese Fellowship of £400, tenable for two years, at University College, London.

The Trustees have renewed the following Fellowships for the same year: Mr. W. R. Angus (British Fellow), University College, London. Dr. James Bell (Glasgow Fellow), University College, London.

The Ramsay Memorial Fellowship Trustees and Advisory Council have adopted a resolution in honour of their late Chairman, Sir Hugh Bell. They place on record their sense of the great loss which they have sustained in the death of the first Chairman of the Trustees, Sir Hugh Bell.

From Week to Week

RECENT WILLS include : Mr. George Craig, F.I.C., consulting chemist, chemical engineer, and analytical chemist, 9, Hampden Terrace, Mount Florida, Glasgow, £35,193.

THE REV. GEORGE WILLIAM NEWMAN, of Cheltenham, has left a bequest of £1,000 to the President and Council of Cheltenham College for the purpose of founding a scholarship in chemistry.

ON THE GROUND THAT TURPENTINE and other substitutes are being imported extensively mixed with petrol, thus cheating Australian motorists, it is proposed to increase the present penny a gallon duty on turpentine to sevenpence a gallon, thus equalling the duty on petrol.

FRANCIS GOODWIN, a chemical engineer employed at the Paris works of one of Lever Brothers' subsidiary companies, has lost his life while climbing in the Alps. Mr. Goodwin entered the chemical laboratories of Lever Bros., at Port Sunlight, when he was 17, and his parents reside at Wallasey.

STUDENTS FROM ST. ANDREWS UNIVERSITY, representative of the various years and Faculties, will shortly tour the eastern states of the Dominion of Canada under the auspices of the Canadian Overseas Education League and the University Court. The party numbers about 20, and is in charge of Professor John Read, Professor of Chemistry in the United College, St. Andrews.

WHEN THE UNIVERSITY OF LIVERPOOL commemorates the fiftieth anniversary of the foundation of University College, in December, an outstanding event will be the conferment of honorary degrees upon twelve people of distinction. Professor H. Hele-Shaw, Emeritus Professor of Engineering, University of Liverpool, will receive the honorary degree of Doctor of Engineering.

CANADIAN CHEMICAL IMPORTS in 1930 amounted to $36,785,000, of which about 65 per cent. was from the United States, 13 per cent. from the United Kingdom, 10 per cent. from Germany, 4 per cent. from France, 3 per cent. from the Netherlands, and 2 per cent. from Belgium. Of the total chemical exports ($16,320,506) over 55 per cent. was sold to the United States and 20 per cent. to the United Kingdom.

ATHOLE G. ALLEN AND CO., of Stockton-on-Tees, have recently been favoured by H.M. Government with further important contracts for the supply of tri-nitro-toluol which will be manufactured at their chemical works at Stockton-on-Tees. This will give additional work to men in the district who might otherwise be unemployed, and illustrates the progress being made by the firm, who, at the end of 1928, took over the entire works at Stockton when offered for sale by auction.

PROFESSOR ALEX. FINDLAY, of the chemistry department, University of Aberdeen, is collecting material for a history of the teaching of chemistry in Aberdeen, and would be glad to have information regarding one of his predecessors in the chair of chemistry—namely, Andrew Fyfe, professor of chemistry in King's College, Aberdeen, from 1842 to 1861. He is also anxious to obtain a portrait of Professor Fyfe and one of John Shier, who for a number of years acted as deputy professor of chemistry at Aberdeen.

DR. G. M. BENNETT has been chosen to succeed Prof. W. P. Wynne, F.R.S., as Firth Professor of Chemistry in the University of Sheffield. Since 1924 Dr. Bennett has been lecturer on organic chemistry in the University of Sheffield. He was originally a pupil of H. Picton, the pioneer worker in colloid research. The work published from Sheffield by Dr. Bennett and his students during recent years has dealt more particularly with the influence of structural, steric and polar factors on reactivity, and with the stereochemistry of disulphoxides and related compounds.

THE UNIVERSITY OF ILLINOIS has issued printed abstracts of a large number of theses submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Chemistry, 1931. The subjects cover a wide range from that of " procedures applied in the separation and determination of the alkali metals " to " X-ray studies of rolling and heat treatment of sheet metals." One thesis, submitted by Gordon Hughes, relates to anhydrous yttrium salts and to an electrolytic separation of rare earths, the result of research carried out under the direction of Professor B. S. Hopkins.

MR. L. DU PONT, of E. I. du Pont de Nemours and Co. Wilmington (Delaware), has been elected president of the Manufacturing Chemists' Association of the United States.

GERMAN POTASH EXPORTS in the first half of this year amounted to 355,070 tons, valued at £1,757,000, compared with 471,765 tons, valued at £1,520,000, in the first six months of last year.

MR. W. L. GERMAN, of the department of chemistry at the University of the South West, has been notified that the University of London has conferred upon him the degree of Doctor of Philosophy.

AT A RECENT CONFERENCE of six German explosives concerns, now under the control of the I.G., a plan was formulated to effect the absorption of all companies by a holding concern, the Dynamit A.G., formerly the Alfred Nobel Company. This plant is expected to simplify management and control of the explosives industries.

IT IS REPORTED FROM BERLIN that the board of the Stickstoffenwerker Co., the nitrogen concern of Waldenburg, proposes to file a petition in bankruptcy. The company was reported to be in difficulties in December last year, and had received a moratorium, at first until March this year, and then until September of this year.

THE EMPIRE MARKETING BOARD has made a grant of £15,790, spread over five years, towards a scheme for the development of rice research in India, which aims at increasing the yield and improving the quality of Indian rice. About 33,000,000 tons of rice are produced annually in India, of which only a small proportion is exported.

RAPID PROGRESS is being made in the erection of the new oil refinery which the British American Oil Co. is building in Montreal East at a cost of over £400,000. This refinery will have a capacity of between 12,000 and 15,000 barrels of crude oil per day, or more than the combined capacity of the company's two existing refineries at Toronto.

A BENZOL PLANT ATTENDANT, Albert Creighton (33), of Cope Street, Barnsley, was found dead in the benzol washer house at the Wharncliffe Woodmoor Colliery, early on Saturday last, August 1. He was lying in a tank in which benzol is washed, and is believed to have been overcome by fumes while cleaning out the tank. At the inquest on Tuesday, August 4, a verdict of " accidental death " was returned.

A DESTRUCTIVE FIRE broke out on Wednesday morning, August 5, at the North British Rubber Works, Edinburgh. The seat of the fire was the devulcanising department, and the firemen's task was a difficult one owing to poisonous gases and smoke with which they had to contend. The fire was extinguished after five hours' work. The damage is estimated at £20,000, but it is hoped that not more than thirty men will be temporarily out of employment.

DR. T. J. DRAKELEY, head of the department of chemistry and rubber technology at the Northern Polytechnic, London, has been elected principal of this institution in succession to Dr. R. S. Clay, who is retiring. Dr. Drakeley has been at the Northern Polytechnic for twelve years, and was previously lecturer in chemistry at Wigan for about seven years. He studied under the late Sir William Ramsey and Professor J. N. Collie.

FIVE MEMBERS of the West Lothian County Council, headed by Mr. Dan Robertson, recently interviewed the President of the Board of Trade and the Minister of Mines on the question of the crisis in the Scottish shale oil industry. The purpose of their mission was to persuade the Ministers to give State aid to the industry so as to enable it to survive the difficult period through which it is passing. Two thousand men are already idle in the shale fields, and without outside aid the remaining six thousand miners will remain in employment for a short period only.

Obituary

JOHN FARRANT, formerly chief cashier of the United Alkali Co., Ltd., has died at Wallasey, aged 78.

PROFESSOR DR. EMIL WARBURG, one of the best known German physicists and president of the German Physical-Technical Institute, has died at the age of 86. He studied chemistry at Heidelberg University, but later, under the influence of Kirchoff's lectures on experimental physics, turned his attention to that subject.

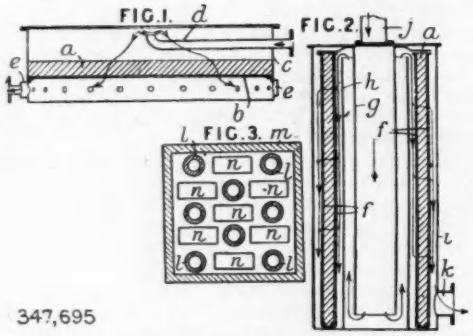
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

347,695. CATALYTIC AGENTS AND APPARATUS. Holzverkohlungs Industrie Akt. Ges., Constance, Baden, Germany. International Convention date, January 24, 1929.

Acetone is produced by the catalytic treatment of acetylene and steam by passing the mixture through a layer of the catalyst 3—4 metres diameter and 10 centimetres thick.



The catalyst *a* may be supported on a perforated plate *b* and the gas mixture passed in through pipe *d* and the products drawn off through the annular conduit *e*. The catalyst may be of iron wire gauze sheets, oxidised, and impregnated with additional substances. Alternatively, the catalyst may be in a cylindrical layer *a* supported between perforated cylinders *f*. The gas mixture enters at *j*, passes down through cylinder *g*, up through cylinder *h*, and then through the catalyst layer to the outlet *k*. A number of catalyst cylinders *l* and heat exchangers *n* may be arranged in a chamber *m*.

347,727. CRACKING HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 2, 1930.

Hydrocarbons boiling above 200° C. are treated with free halogen or hydrogen at 0°—150° C. and atmospheric or higher pressure, and then at 100°—500° C. with activated aluminium. The aluminium is prepared by treatment with a salt of a less electro-positive metal to deposit the metal on the aluminium. The activated aluminium may be treated with hydrogen chloride while being heated to the cracking temperature. In the first stage, hydrogen halides are evolved, and may be introduced with or without an inert gas such as nitrogen in the second stage. The products are fractionally condensed or distilled, and are purified by washing with soda or caustic soda. The residue is mixed with basic substances and subjected to low temperature carbonisation as described in specification No. 320,891 (See THE CHEMICAL AGE, Vol. XII, p. 628). In an example, paraffin oil boiling at 350° C. is treated with chlorine until the weight is increased 65 per cent. and the temperature to 100° C. The product is mixed with an equal weight of gas oil and is passed with nitrogen or hydrogen halide from the first stage at 250° C. over aluminium activated with mercuric chloride. Another example is given of the treatment of gas oil alone. The cracked products from the bottom of the treating tower pass to a collecting vessel, and thence to a dephlegmator.

347,729. MIXED FERTILISERS. Soc. l'Air Liquide, Soc. Anon. pour l'Étude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. Assignees of Soc. Belge de l'Azote, Soc. Anon., Ougree, Belgium. International Convention date, January 3, 1929.

A mixture of sodium and potassium chloride is treated by the ammonia-soda process but instead of carbon dioxide a gas mixture obtained by oxidation of the gases produced by the high temperature reduction of phosphates is used. Sufficient ammonia is used to combine with the phosphorus oxides to obtain ammonium phosphate. The liquor is cooled to obtain a mixture of potassium and ammonium chlorides and ammonium phosphate. The mother liquor is treated with ammonia, carbon dioxide and phosphorus oxides to precipitate sodium bicarbonate which is removed, and the mother liquor treated with ammonia, carbon dioxide and phosphorus oxides, and sodium and potassium chlorides. If the mineral containing sodium and potassium chlorides contains magnesium salts also, these may be finally converted into phosphates.

347,120. DYES AND INTERMEDIATES. D. A. W. Fairweather, J. Thomas, and Scottish Dyes, Ltd., Grangemouth, Scotland. Application date, October 16, 1929.

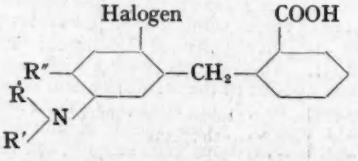
2-Aminoanthrahydroquinone-9 : 10-disulphuric ester or its substitution products having the 1-position free are subjected to acid or alkaline oxidation, and the resulting aminohydroxyanthrahydroquinone sulphuric esters are used as components of azo dyes, either by diazotization and coupling with the usual components or by coupling with diazo compounds. The monoazo dyes obtained by using the esters as diazo components may be further coupled with diazo components to obtain disazo dyes, and the dyes containing amino groups may be diazotized and coupled to obtain disazo, trisazo or polyazo dyes. Nitro groups may be reduced, diazotized, and further coupled. Examples are given of the oxidation of the sodium salt of 2-aminoanthrahydroquinone disulphuric ester with sodium hypochlorite and 2-amino-3-chlor-anthrahydroquinone disulphuric ester with ferric chloride in acetic acid. The latter product may be diazotized and coupled with the *o*-anisidide of 2 : 3-oxynaphthoic acid. The resulting azo dye gives red-violet shades, changing to red on treatment with acid oxidizing agents ; it may be coupled with *p*-nitraniline to obtain a product which dyes dull-red, becoming scarlet in an acid oxidizing bath. The first oxidation product referred to above may be diazotized and coupled with 1-phenyl-3-methyl-5-pyrazolone, *m*-amino-*p*-cresol methyl ether or *m*-phenylene-diamine ; in the latter case the product may be further coupled with *m*-phenylene-diamine. Several other examples are given.

347,141. THIAZOLES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 22, 1930.

A 2-aminoaryl-thiazole compound is treated with chlorine or bromine, or substances yielding them, to obtain nuclear halogenated 2-aminoaryl-thiazoles. The 2-aminoaryl-thiazole compound may be obtained by the action of chlorine, etc., on the corresponding arylthiourea compound in situ. The products may be treated with caustic alkali solution to obtain the corresponding halogenated o-aminoaryl-mercaptans. In an example, 2-aminobenzo-thiazole is treated with sodium chlorate and hydrochloric acid to obtain 2-amino-6-chlorobenzo-thiazole. In another example, 2-amino-4-methylbenzothiazole hydrochloride is produced in situ by the action of sulphuryl chloride on *o*-tolyl-thiourea, and is treated with chlorine to obtain the 6-chloro derivative, which may be treated with caustic alkali solution to obtain 1-methyl-5-chloro-2-aminophenyl-3-mercaptan.

347,171. DYE INTERMEDIATES. Newport Co., Carrollville, Wis., U.S.A. International Convention date, January 2, 1929. Addition to 314,804.

Benzyl-*o*-benzoic acids having the formula



where R and R′ represent hydrogen or together represent a dibasic organic acid residue, *e.g.*, the phthaloyl residue, or

R represents hydrogen and R′ represents an acidyl residue, *e.g.*, acetyl, benzoyl or toluenesulphonyl, and R″ represents hydrogen methyl, methoxy, ethoxy, halogen, carboxylic or sulphonic acid or other monovalent substituent, are obtained by chlorinating the corresponding body having a free 6′-position. The starting material may be the 3′-acidylamino derivative. Examples are given of the preparation of halogen derivatives of 3′-acetylamino-4′-methoxybenzyl-*o*-benzoic acid, 3′-acetylamino-4′-chlorobenzyl-*o*-benzoic acid, 3′-acetylamino-4′-methylbenzyl-*o*-benzoic acid, and others.

347,193. CARBAZOLE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, January 23, 1929.

Aminocarbazole sulphonic acids or their substitution products are diazotized and the diazo group replaced by OH, Cl, Br, I, CN, SH, or -S-S-. Examples are given of the preparation of 1-oxycarbazole-3 : 6 : 8-trisulphonic acid, 1-oxy-8-iodocarbazole-3 : 6-disulphonic acid, 1 : 1′-dicarbazole-disulphide-3 : 3′-6 : 6′-8 : 8′-hexasulphonic acid and others. The diazo group may also be replaced by thiocyano, mercapto, hydrazino, arsinic and stibinic acid groups.

347,195. DYE INTERMEDIATES. Newport Co., Carrollville, Wis., U.S.A. International Convention date, January 2, 1929. Addition to 340,519.

3′-Amino or 3′-acidylamino-4′-substituted or unsubstituted 6′-halogenbenzyl-*o*-benzoic acids are condensed by sulphuric acid, phosphorus pentoxide, or phosphorus pentachloride to effect ring closure to the 1-amino- or 1-acidylamino-2-substituted or unsubstituted-4-halogen-9-anthrones. The starting substances are prepared as described in specification 347,171 (above) and examples of the condensation are given.

347,233. DYES. C. Shaw, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, October 17, 1929.

Nitro-dibenzanthrone and nitroiso-dibenzanthrone are heated at 250° C. with phthalic anhydride to obtain products which dye black, blue-black and grey shades.

347,234 AND 347,236. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 24, 1929. Additions to 340,262 and 306,874 respectively.

347,234. Halogenated dibenzanthrones and isodibenzanthrones are treated with a different halogen in the presence of a catalyst and in an organic solvent or diluent such as nitrobenzene, trichlorbenzene, acetic anhydride or quinoline. The added halogen may replace halogen in the starting material, or may replace nitro or sulpho groups. The preparation of chlorobromo derivatives is described.

347,236. Benzanthrone derivatives in which an anthraquinone radicle containing an aldehyde group is attached by means of an NH group to the benzanthronyl radicle, are treated with alkaline condensing agents. The alkali fusion of the condensation products from 8-chlorbenzanthrone and 1-aminoanthraquinone-2-aldehyde, 6 chlorbenzanthrone and 1-aminoanthraquinone-2-aldehyde, dibrom-2 : 2′-dibenzanthronyl and 1-aminoanthraquinone-2-aldehyde is described. The products dye grey to black shades.

347,288. DYES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 27, 1930.

Aromatic diazo compounds are coupled with aminonaphthols containing one or more unsubstituted sulphamino residues or derivatives in acid or alkaline solution, to obtain monoazo dyes, soluble in water, and suitable for dyeing wool and in some cases acetate silk and for the manufacture of pigments. Examples are given of the coupling of aniline-2-sulpho acid, 4-toluidine-3-sulpho acid or 4-acetylamino-1-aminobenzene-2-sulpho acid→1-acetylamino-8-naphthol-3- : 6-disulpho-di-(N-methylanilide) ; aniline-2 ; 5- or 2 : 4-disulpho acid, 3-nitraniline-4-6-disulpho acid or 2-amino-4^1-hydroxy-3^1-carboxy-diphenyl-sulphone 4-sulphonic acid→2-amino-8-naphthol-6-sulpho-N-methyl-aniline ; 1-amino-4-acetylaminobenzene-2-sulphonic acid → 2-amino-8-naphthol-6-sulpho-N-hydroxy-ethyl-anilide, and several others.

347,290. DYES. I.G. Farbenindustrie Atk.-Ges., Frankfort-on-Main, Germany. Application date, January 27, 1930. Addition to 306,843. (See THE CHEMICAL AGE, Vol. XX, p. 432.)

Dyestuffs containing chromium described in Specification No. 306,843 are obtained by converting the pyrazolones from the amino-aryl-salicyl-sulphones into their chromium compounds and then coupling with aromatic diazo compounds containing no hydroxy group in *o*-position to the diazotized amino group. In an example, the 3-methyl-pyrazolone from 2^1-hydrazino-4^{11}-oxy-3^{11}-carboxy-diphenyl-sulphone-4^1-sulphonic acid and aceto-acetic ester is boiled with aqueous chromium formate, and the product coupled in sodium acetate solution with diazotized 2-chloro-4-amino-toluene. The product dyes wool from an acid bath a fast greenish-yellow shade. Another example is given.

347,323. ACETIC ACID. Holzverkohlungs Industrie Akt.-Ges., Constance, Baden, Germany. International Convention date, February 26, 1929.

Acetaldehyde is oxidised continuously with a large excess of oxygen or gases containing it to avoid accumulation of peracetic acid. The reaction may be effected at 55°–80° C. and a pressure of 1·5 atmospheres, the reactants being mixed by means of stirrers or by causing them to pass through turbo mixers. The acetic acid is purified by distillation, and acetaldehyde in the waste gases recovered by washing first with the crude reaction product, and then with acetic acid free from acetaldehyde.

347,407. DYE INTERMEDIATES. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 12, 1930.

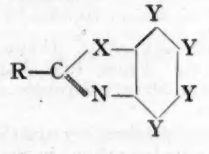
An alkali metal salt of 1 : 2-dimethyl- or 1-methyl-2-halogen-4-hydroxybenzene is treated with carbon dioxide under pressure, whereby the COOH group enters an *o*-position to the OH group.

347,493. ACETYLENE. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 8, 1930.

Hydrocarbons or gases containing them are burnt with insufficient oxygen to convert them to carbon dioxide and water in the presence of elementary silicon at pressures of 0·-55 atmospheres and temperatures of 700°–1,100° C. Acetylene is produced and may be used directly for reactions such as the synthesis of acetyldehyde. In an example, a mixture of 90 per cent. of propane and butane with nitrogen, hydrogen, carbon dioxide and methane is burned with air in contact with electrically heated silicon at 850°–900° C.

347,515. SYNTHETIC DRUGS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 10, 1929.

The process is for preparing quinoline and acridine compounds of the general formula.



where Y represents hydrogen or any univalent residue, X represents O, S, or NH, and R represents a substituted quinoline or acridine residue containing at least one substituted or unsubstituted NH_2 in its nuclei. Two methods are described, (1) a correspondingly substituted benzthiazolyl-, benzoxazolyl-, benzimidazolyl-halogen quinoline or acridine compound directly or after conversion to the corresponding ether is treated with ammonia or a primary or secondary amine, (2) a quinoline or acridine carboxylic acid which contains in the nucleus a nitro group or a primary, secondary or tertiary amino group is converted into the corresponding benzthiazole, benzoxazole, or benzimidazole, the nitro group being reduced where necessary. Compounds containing an alkoxy group may be hydrolysed to the corresponding oxy compound. A large number of examples of these reactions are given.

347,543. MIXED FATTY AROMATIC KETONES. Schering Kahlbaum Akt.-Ges., 170, Müllerstrasse, Berlin. International Convention date, July 9, 1929.

Vapours of aromatic dicarboxylic acids or anhydrides, and vapours of aliphatic carboxylic acids are passed over oxides or carbonates of alkaline earth, earth, and heavy metals, *e.g.*, thoria, manganous oxide, ferrous oxide, alumina or calcium carbonate, at a temperature of 350°–400° C. In an example a mixture of phthalic anhydride and acetic acid is treated, yielding a mixture of acetone and aceto-phenone.

347,592. WETTING AGENTS. Naamlooze Vennootschap Chemische Fabriek Servo and M. D. Rozenbroek, Delden, Twente, Overijsel, Holland. International Convention date, January 22, 1929.

Fat-splitting agents which may also be used in the leather and textile industries, are obtained by sulphonating aliphatic carboxylic acids containing at least 12 carbon atoms in the molecule or their derivatives in the presence of aliphatic oxysulphonic acids or their sulphuric esters or salts. Naphthalene, toluene, xylene, or their hydrogenated products may be added before the sulphonation. The fatty acids may be partly sulphonated before adding the oxysulphonic acids, and may also be converted into their anhydrides or chlorides before sulphonation. Examples are given of the sulphonation of castor oil and its fatty acids, linseed oil, and other oils.

347,613. DYE INTERMEDIATES. R. J. Loveluck, J. Thomas, E. G. Beckett, and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, October 17, 1929.

A dichlor-phthalic anhydride is condensed with benzene, and the dichlor benzoyl, benzoic acid obtained is treated with ammonia or methyl-amine to replace one atom of chlorine, and the product then ring-closed. Examples are given of the treatment of 3 : 4- and 4 : 5-dichlorphthalic anhydride to obtain the corresponding amino-chloranthraquinones.

347,609. DYES. J. F. Turskfi, 74, Koszykowa Street, Warsaw. Application date, January 28, 1930.

Compounds of the type X-R-NH-CO-R^1-Y in which R and R^1 represent arylene and X and Y are hydroxy or amino groups, there being at least one amino group and Y being always hydroxy when R^1 is other than arylene, are treated with nitrous acid and then with reagents which cause the diazotized compound to couple with itself, to obtain monoazo, disazo, trisazo, and higher polyazo products. Compounds treated include aminoanilides of salicylic acid, 2 : 3-oxynaphthoic acid, pyrazolone-carboxylic acids, aceto-acetic acid, aminobenzoic acids, and also monosalicyl-benzidines. Examples of these azo dyes in substance and on the fibre are given. The production of the above aminoarylamides is also described. These are obtained (1) by reduction of the nitroarylides, of the types NO_2-aryl-NH-CO-aryl-OH, HO-aryl-NH-CO-aryl-NO_2 and NO_2-aryl-NH-CO-aryl-NO_2, (2) by condensing a diamine with an oxycarboxylic acid chloride in the presence of toluene, etc., and a condensing agent such as phosphorus tri-chloride. The diamine may be monoacidylated and the acidyl group then be removed by hydrolysis. A number of examples are given of the production of the amino-arylides.

357,620. LIQUID UNSATURATED HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 17, 1930.

These products are obtained by oxidising liquid or solid paraffin or naphthene hydrocarbons in the presence of barium cinnamate, uranyl tungstate, or manganese naphthenate. The products containing alcohols, hydroxy acids, esters, lactones, aldehydes, ketones, etc., are then heated above 180° C. in the presence of catalysts to split off water and/or carbon dioxide. The oxidation may be in gaseous or liquid phase. The production of alcohols may be increased by employing boric acid or vanadium pentoxide as catalyst, and also by hydrogenating the aldehydes and ketones. The crude products may be treated in various ways to remove acid constituents, etc.

Specifications Accepted with Date of Application

352,928. Complex salts of trivalent antimony yielding neutral solutions, Process for the manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) January 14, 1930.

352,934. Finely divided phenolphthalein, and compositions containing the same, Production of. E. B. Putt. April 4, 1930.

352,935. Esterification of fatty acids and mixtures containing fatty acids. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 5, 1930.

352,956. Substantive dyeing disazo dyestuffs containing copper, Process for the manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) April 14, 1930.

352,964. Iron-titanium alloys. W. Kroll. February 16, 1929.

352,981. Condensation products, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 12, 1930.

352,999. Aralkyl ethers of cellulose, Manufacture of. Imperial Chemical Industries, Ltd., D. Traill and A. S. Levesley. April 16, 1930.

353,032. Alkyl chlorides and/or alkyl bromides from olefines or mixtures containing olefines, Manufacture of. E. H. Strange and T. Kane. January 20, 1930.

353,047. Alcohols, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 10, 1930.

353,054. Purifying and refining mineral oils. W. W. Triggs. (*Richfield Oil Co. of California.*) April 15, 1930.

353,055. Refining hydrocarbon oils. Richfield Oil Co. of California. May 8, 1929.

353,071. Acetaldehyde, Production of. K. Wiesler, A. M. Peake and British Industrial Solvents, Ltd. April 17, 1930.

353,076. Formaldehyde from methane and carbon dioxide, Production of. Gutehoffnungshutte Oberhausen Akt.-Ges. April 29, 1929.

353,100. Decomposition of gaseous hydrocarbons to obtain hydrogen and a high grade carbon black. Soc. d'Etudes et Realisation Dite Ereal. April 30, 1929.

353,113. Naphthalene derivatives, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 3, 1929.

353,124. Vat-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 10, 1929. Addition to 11,940/30.

353,138. Formamidines, Manufacture of. Imperial Chemical Industries, Ltd., T. Birchall, and E. H. Rodd. May 16, 1930.

353,152. Chromium oxide, Manufacture of. J. E. Demant. May 22, 1930.

353,180. Sponge iron, Manufacture of. I. Rennerfelt and I. C. S. G. Bohm. June 12, 1930.

353,193. Higher fatty acid esters of polymeric carbohydrates, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 4, 1929.

353,194. Indiarubber-like products, Manufacture of. G. B. Ellis. (*Soc. des Usines Chimiques Rhône-Poulenc.*) June 19, 1930.

353,212. Treating metallurgical slimes, Process of. Metallges Akt.-Ges. June 28, 1929.

353,230. Cracking oil. R. C. Osterstrom and C. R. Wagner. July 8, 1930.

353,260. 6^1-Chloro-6-methyl-1 : 2 : 3 : 4-tetrahydronaphthalene, and 1 : 2 : 3 : 4-tetrahydro-6-naphthaldehyde, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 29, 1929. Addition to 1,097/30.

353,276. Cracking of hydrocarbon oils. A. E. White. (*Texas Co.*) August 12, 1930.

353,307. Fractional extraction of mineral oils. H. G. C. Fairweather. (*Atlantic Refining Co.*) September 5, 1930.

353,318. Ethylidene diacetate, Manufacture of. Courtaulds, Ltd. and J. Brown. September 20, 1930.

353,361. 1-phenyl-2-aminoalcohols (1) hydroxylated in the phenyl nucleus. I.G. Farbenindustrie Akt.-Ges. November 26, 1929.

353,371. Reducing zinciferous materials. New Jersey Zinc Co. December 30, 1929.

353,373. Hydroaromatic carboxylic acids, Manufacture of. Schering-Kahlbaum Akt.-Ges. January 11, 1930.

353,381. Acetic and other organic acid anhydrides, Manufacture of. U.S. Industrial Alcohol Co. May 28, 1930.

Salters' Institute of Industrial Chemistry

THE following awards for the year 1931–1932 have been made by the Salters' Institute of Industrial Chemistry, and approved by the Court of the Salters' Company :

Fellowships have been renewed to D. L. Hodge, of the Imperial College, London ; D. J. Branscombe, of University College, Exeter ; J. Hofton, of Caius College, Cambridge ; and H. G. Simpson, of East London College.

Fellowships have been awarded to : J. L. Sweeten, of St. Catherine's College, Cambridge, and Norman Stuart, of the Imperial College, London.

The Salters' Institute has also awarded 113 grants in aid to young men and women employed in chemical works to facilitate their further studies.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£17 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity · ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3½d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K., or 3½d. c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in drums. Crystals—Spot, £8 5s. per ton, d/d in casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 5½d. to 6½d. per gall.; Standard Motor, 1s. to 1s. 1d. per gall. 90%.—1s. 1d. to 1s. 2d. per gall. Pure, 1s. 4d. to 1s 5d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 7d. to 1s. 8d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 3¾d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 52s. 6d. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated :—
ACID GAMMA.—Spot, 3s 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7½d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d per lb. d/d buyer s works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity: drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4½d. to 5½d. per lb.; Dark, 4¼d. to 4¾d. per lb.
LAMP BLACK.—£28 per ton, barrels free.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 4d. to 6s. 10d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.

ACID, ACETIC, PURE, 80%.—£35 5s. per ton d/d address U.K. in casks.

ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.

ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—10½d. per lb., less 5%.

ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—10½d. per lb., less 5%.

AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.

AMMONIUM BENZOATE.—3s. 6d. per lb.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—2s. 10d. per lb.

BISMUTH CARBONATE.—7s. 9d. per lb.

BISMUTH CITRATE.—8s. 7d. per lb.

BISMUTH SALICYLATE.—7s. 11d. per lb.

BISMUTH SUBNITRATE.—6s. 9d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.

BISMUTH OXIDE.—10s. 9d. per lb.

BISMUTH SUBCHLORIDE.—10s. 5d. per lb.

BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.

BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.

CAFFEIN, PURE.—6s. 6d. per lb.

CAFFEIN CITRAS.—5s. per lb.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.

CAMPHOR.—Refined flowers, 2s. 8d. to 2s. 10d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.

CHLOROFORM.—2s. 3d. to 2s. 6d. per lb., according to quantity.

ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.

GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.

HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.

HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5½d. per lb. in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.

IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.

MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.

MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 14s. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 9s. 9d. per lb., according to quantity; Liquid (95%), 8s. per lb.

MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 7s. 4d. to 7s. 5d. per lb., levig., 6s. 11d. to 7s. per lb.; Corrosive Sublimate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 3d. to 5s. 4d. per lb.; White Precipitate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 11d. to 6s. per lb.; Calomel, 6s. 3d. to 6s. 4d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 10d. per lb.; Persulph, B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 6s. 5d. to 6s. 6d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.

PARAFORMALDEHYDE.—1s. 6d. per lb.

PARALDEHYDE.—1s. 1d. per lb.

PHENACETIN.—3s. 9d. to 4s. 1d. per lb.

PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—78s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.

POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.

POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.

POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.

SACCHARIN.—43s. 6d. per lb.

SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.

SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.

SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.

SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.

SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.

STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.

THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—8s. 9d. per lb.

AMYL ACETATE.—2s. 3d. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL CINNAMIC ALDEHYDE.—8s. 6d. per lb.

AMYL SALICYLATE.—2s. 6d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.

BENZYL BENZOATE.—2s. 2d. per lb.

CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.

COUMARIN.—12s. per lb.

CITRONELLOL.—7s. 3d. per lb.

CITRAL.—6s. per lb.

ETHYL CINNAMATE.—6s. 9d. per lb.

ETHYL PHTHALATE.—2s. 6d. per lb.

EUGENOL.—7s. 6d. per lb.

GERANIOL.—6s. to 10s. per lb.

GERANIOL (FROM PALMAROSA).—14s. per lb.

HELIOTROPINE.—5s. 6d. per lb.

ISO EUGENOL.—9s. per lb.

LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.

LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.

METHYL ANTHRANILATE.—6s. per lb.

METHYL BENZOATE.—4s. 3d. per lb.

MUSK XYLOL.—6s. 6d. per lb.

PHENYL ETHYL ACETATE.—10s. per lb.

PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.

RHODINOL.—40s. per lb.

SAFROL—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.

BERGAMOT OIL.—8s. 6d. per lb.

BOURBON GERANIUM OIL.—17s. 6d. per lb.

CAMPHOR OIL.—White, 100s. per cwt.; Brown, 100s. per cwt.

CANANGA.—Java, 7s. per lb.

CINNAMON OIL LEAF.—4s. per oz.

CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. Pure Ceylon, 2s. per lb.

CLOVE OIL, 90/92%.—6s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 4d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.

LEMON OIL.—4s. 3d. per lb.

LEMONGRASS OIL.—2s. 9d. per lb.

ORANGE, SWEET.—8s. per lb.

OTTO OF ROSE.—Anatolian, 40s. per oz.; Bulgarian, 60s. per oz.

PALMA ROSA.—8s. 9d. per lb.

PETITGRAIN.—5s. 9d. per lb.

SANDALWOOD.—Mysore, 28s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, August 6, 1931.

NOTWITHSTANDING the holidays there is a steady demand for all chemicals and prices remain practically unchanged.

General Chemicals

ACETONE.—There is a satisfactory demand at £60 to £63 per ton, according to quantity.

ACID ACETIC.—Technical 80% at £34 5s. to £36 5s. per ton and pure 80% from £35 5s. to £37 5s. per ton, with a steady demand.

ACID CITRIC.—Remains quiet at about 11½d. per lb., less 5%.

ACID FORMIC.—Unchanged and in fair demand at £37 per ton.

ACID LACTIC.—50% by weight pale quality, about £38 per ton with a good steady call.

ACID OXALIC.—Firm at £34 per ton in casks and £35 per ton in 1 cwt. kegs, carriage paid, with a regular demand.

ACID TARTARIC.—Rather slow at about 10½d. per lb., less 5%.

ALUMINA SULPHATE.—Quiet at £7 5s. to £8 5s. per ton for the 17/18% iron free quality.

ARSENIC.—Cornish material is still unobtainable for early delivery with the market nominal at about £20 per ton. Imported material is on offer at about £19 to £19 10s. per ton.

CREAM OF TARTAR is quiet at about £78 to £79 per ton, ex store London.

COPPER SULPHATE.—Steady at about £19 10s. per ton.

FORMALDEHYDE.—In steady request at about £28 per ton.

LEAD ACETATE.—In a little better demand, with white at £31 15s. per ton, and brown £30 15s. per ton.

LITHOPONE.—Steady at £18 to £22 per ton, according to grade and quantity.

POTASSIUM BICHROMATE.—4¼d. per lb., with usual discounts for contracts.

POTASSIUM CHLORATE.—Firm at £28 to £32 per ton, and in steady request.

PERMANGANATE OF POTASH.—Firm at 5¼d. to 5½d. per lb., ex warehouse London for needle crystals B.P., with a steady daily demand.

SODIUM BICHROMATE.—3¾d. per lb., with usual discounts for contracts.

SODIUM HYPOSULPHITE.—Commercial crystals about £8 10s. per ton, with photographic crystals in good demand at £14 5s. per ton.

SODIUM PRUSSIATE.—Firm at 4¾d. to 5¼d. per lb.

TARTAR EMETIC.—Steady at about 10½d. per lb., and in somewhat better request.

ZINC SULPHATE.—Improved demand continues at £10 10s. per ton.

Coal Tar Products

THERE is little or no change to report in the coal tar products market, and prices remain unaltered from last week.

MOTOR BENZOL.—Unchanged at about 1s. 4½d. to 1s. 5½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Quoted at about 1s. 1½d. to 1s. 2d. per gallon f.o.r.

HEAVY NAPHTHA.—Worth about 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL.—Remains at about 3d. to 3¼d. per gallon f.o.r. in the North and at about 4d. to 4¼d. per gallon in London.

CRESYLIC ACID.—Unchanged at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Worth about £3 10s. to £3 15s. per ton for the firelighter quality, about £4 to £4 5s. per ton for the 74/76 quality, and about £5 per ton for the 76/78 quality.

PITCH.—Quoted at 45s. to 47s. 6d. per ton, f.o.b. East Coast port, for forward delivery.

Nitrogen Fertilisers

Sulphate of Ammonia—Export.—The present price of sulphate of ammonia f.o.b. U.K. port in new single bags is about £5 17s. 6d. per ton. At the moment buyers do not appear to be anxious to purchase any but their immediate requirements. *Home.*—As already announced, the British producers have reduced the price to £6 10s. per ton delivered to farmer's nearest station, in six-ton lots, for any period up to June 30 next. It is understood that some merchants are covering their requirements at this figure.

Nitrate of Soda.—The prices for this product have not yet been announced, but it is expected that they will be in line with the sulphate of ammonia prices.

Scottish Coal Tar Products

DESPITE the inclement weather large quantities of refined tars for road-making are leaving the works and consequently distillers are not yet considering pitch for forward shipment. Other products are quiet with quotations irregular.

Cresylic Acid.—Some cheap offers are in circulation but buyers are scarce. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon f.o.r. naked. High boiling is firm at 2s. to 2s. 6d. per gallon according to grade.

Carbolic Sixties.—Stocks are high and value is round 1s. 1d. to 1s. 3d. per gallon according to quality.

Creosote Oil.—With demand capable of looking after supply, prices are steady. Specification oils, 2¾d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gasworks ordinary, 3½d. to 3¾d. per gallon; all f.o.r. in bulk.

Coal Tar Pitch.—Makers are not yet offering for forward delivery. Value is nominal at 40s. to 42s. 6d. per ton, f.a.s. Glasgow for export, and 37s. 6d. to 40s. per ton, f.o.r. works for home trade.

Blast Furnace Pitch.—Controlled prices remain at 30s. per ton, f.o.r. works for home trade, and 35s. per ton, f.a.s. Glasgow for export.

Refined Coal Tar.—Throughput is well maintained. Value to-day is steady at 2¼d. to 2½d. per gallon, f.o.r. makers' works naked.

Blast Furnace Tar.—Unchanged at 2¾d. per gallon, f.o.r.

Crude Naphtha.—Available supplies command 4¼d. to 5¼d. per gallon, according to quality.

Water White Products.—Very few orders are being received and prices are easy. Motor benzole is 1s. 3d. to 1s. 4d. per gallon; 90/160 solvent 1s. 2d. to 1s. 3d. per gallon; and 90/190 heavy solvent, 1s. to 1s. 1d. per gallon; all ex works.

Latest Oil Prices

LONDON, August 5.—LINSEED OIL was dull and 12s. 6d. per ton lower. Spot, £17, ex mill; August, £14 7s. 6d.; September-December, £14 12s. 6d.; and January-April, £15 10s., naked. RAPE OIL was idle. Crude, extracted, £26; technical, refined, £27 10s., naked, ex wharf. COTTON OIL was dull. Egyptian, crude, £19; refined common edible, £22; and deodorised, £24, naked, ex mill. TURPENTINE was easy forward. American, spot, 47s.; September-December, 37s. 6d., per cwt.

HULL.—LINSEED OIL.—Spot to December closed at £15 2s. 6d.; January-April at £15 12s 6d. per ton, naked. COTTON OIL.—Bombay, crude spot, unquoted. Egyptian, crude, spot, £18 10s.; edible, refined, spot, £21 2s. 6d.; technical, spot, £21 2s. 6d.; deodorised, £23 2s. 6d. PALM KERNEL OIL.—Crude, f.m.q., spot, £20, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £24; deodorised, £28. RAPE OIL.—Crushed/extracted, spot, £25 10s.; refined, £27 10s. SOYA OIL.—Crushed/extracted, spot, £17 10s.; deodorised, £21 per ton. COD OIL.—17s. per cwt. TURPENTINE.—American, spot, quoted 49s. 3d. per cwt. CASTOR OIL.—Pharmacy, spot, 40s. 6d.; first, 35s. 6d.; second, 33s. 6d. per cwt.

South Wales By-Products

WITH the holidays further curtailing business there has been scarcely any activity in South Wales by-products. Pitch continues to have a quiet market, but, with the prospect of improved patent fuel exports over the autumn, there is a belief that the market will strengthen during the next few weeks. At present buyers are confining their demands to small parcels for prompt delivery. There is no change in values. Road tar has a fairly steady, if moderate, call round about 13s. per 40-gallon barrel. Refined tars have a fair market, with quotations for coke-oven and gasworks tar unchanged. Naphthas have scarcely any market, while creosote continues to be weak. Patent fuel and coke exports are unsatisfactory. Patent fuel prices, for export: 19s. 9d. to 20s., ex-ship Cardiff; 19s. to 19s. 6d., ex-ship Swansea. Coke prices: Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Eleventh Congress of Industrial Chemistry

THE Eleventh Congress of Industrial Chemistry, which begins on September 27 in Paris, has extended a cordial invitation to the American Chemical Society to send a delegate who will present a paper before one of the sections of the congress. This meeting will take place while the International Colonial Exposition is being held.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, August 6, 1931.

THE closing days of the Glasgow Fair Holidays and the English Bank Holiday has made business in the Scottish heavy chemical market very quiet.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £45 to £56 per ton; pure, £35 5s. per ton; technical, 80%, £34 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3¼d. per lb., ex store. On offer from the Continent at 3¼d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £26 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £23 10s. per ton, ex wharf Spot material still on offer at £24 per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 2s. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £24 10s. per ton ex store. Offered from the Continent at £23 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6½d. per lb. ex wharf

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station. minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 6os. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Non-Inflammable Petroleum Substitute

PROGRESS is reported in the tests being made on the non-inflammable substitute for petroleum spirit, discovered by Mr. Orr, of the Chemical Department of the Belfast Gasworks. Eight omnibuses of the Belfast Omnibus Co. are now being operated on this fuel, and are reported to be giving every satisfaction from a mileage point of view. Several more lorries are being converted to use the fuel, and it is reported that the cost of conversion, approximately £50, can be saved in a very short time. An important feature of the fuel is the absence of exhaust fumes, and this should make it a particularly attractive proposition for omnibus services operating in cities. Further research work is being carried out on creosotes with a view to producing a fuel that will start an engine from cold without the use of petrol. From this it is to be inferred that the present fuel needs petrol to warm the engine up. The manager of the Belfast Corporation Gasworks states that no secret will be made of the fuel, and he hopes to have the process made available to every gasworks throughout the United Kingdom. He estimates the annual production of the Belfast Works at half-a-million gallons.

Belgian Chemical Industries Directory

THE Fédération des Industries Chimiques de Belgique, of 134 rue Berckmans, Bruxelles, Belgium, has issued the 1931 volume of *Les Produits Chimiques Belges*, a 122-page book, which contains a complete list of the members of the federation with an alphabetical list of the products which they manufacture. The information contained in the book is printed in French, English, Spanish, and German.

Reorganisation of Cyprus Asbestos Co.

SEPARATE meetings of preferred and deferred shareholders of Cyprus Asbestos Co., Ltd., are convened for September 14, to confirm an agreement made by the directors on behalf of this company, and a new company, Cyprus and General Asbestos Co., Ltd., for the sale to the new company of the undertaking, property and assets. The capital of the new company is £750,000.

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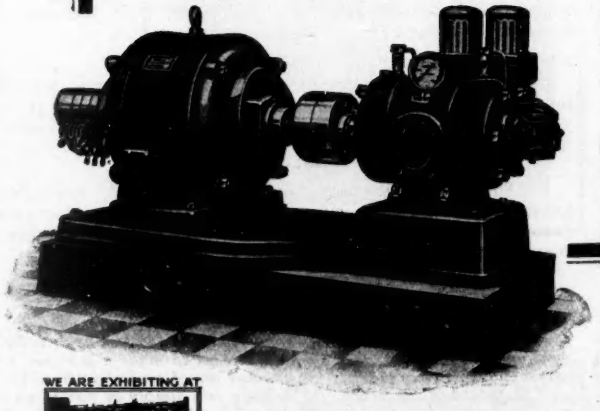
MANUFACTURED in a range of sizes from 6 to 1200 cubic feet per minute capacity, the "Broomwade" Rotary Machine is super-efficient, and its running speed and low starting torque enable it to be direct coupled to comparatively high speed squirrel-cage motors or other forms of driving units.

As a Compressor for pressures from 4 to 40 lbs. per square inch, or as an Exhauster with a vacuum reading within ·23 of the barometer, this machine is pre-eminent in its class, whilst the rugged construction, simplicity, and quality of materials and workmanship are cardinal features which are strikingly apparent to the Plant Engineer.

Among this range there is a machine particularly suitable for your special needs — a machine capable of giving under the most arduous conditions a full measure of efficiency and reliability, and a machine embodying the results of 30 years' exhaustive effort in the design, manufacture and installation of Air Compressing Machinery.

The name "Broomwade" has become the standard by which Air Compressing Machinery is set; that is why Engineers the world over specify "Broomwade" when rigid conditions call only for the Best Possible.



Catalogue "R" will gladly be sent upon request. It will be found both interesting and instructive.

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Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, August 6, 1931.

In accordance with custom the Manchester district, to a large extent, has observed much of the present week as a holiday, and this has been reflected in the aggregate turnover on the chemical market here. Inquiry has been on a contracted scale, and in the majority of cases actual orders have been for small quantities. With regard to quotations there is no general sign of weakness, although in odd instances values seem to be finding slightly lower levels, with, however, the principal lines of heavy chemicals maintaining the firm stand that has been so long in evidence.

Heavy Chemicals

The movement of hyposulphite of soda has been quiet, with the commercial product still on offer at round £9 5s. per ton and the photographic at £15. Chlorate of soda has also been inactive, but quotations keep up in the region of £26 10s. per ton. Little attention has been paid this week to sulphide of sodium, with the commercial grade quoted at from £7 15s. to £8 per ton and the 60-65 per cent. concentrated quality at about £9. Caustic soda has been in moderate request, chiefly against contracts, the basis of which is from £12 15s. to £14 per ton, according to quality. Bicarbonate of soda is unchanged at round £10 10s. per ton. Phosphate of soda is not too strong and the demand has been slow; the dibasic product is quoted in the neighbourhood of £10 per ton. Bichromate of soda meets with a moderate inquiry, and offers of this material are unchanged on the basis of 3½d. per lb., less 1 to 2½ per cent., according to quantity. Prussiate of soda is well held at from 4¾d. to 5¼d. per lb., according to quantity, although no great weight of business has been done on this centre during the past week. Alkali keeps very firm at about £6 per ton, in contracts, with saltcake in quiet demand at from £2 17s. 6d. to £3 per ton.

Among the potash materials, caustic continues to be quoted at about £27 10s. per ton, with sales on quiet lines. Carbonate of potash is attracting little attention at the moment, but at up to £24 10s. per ton there has been little change so far as values are concerned. Bichromate of potash is in moderate demand and prices are maintained on the basis of 4¼d. per lb., less 1 to 2½ per cent., according to quantity. Only quiet sales of permanganate of potash have been reported, with the B.P. quality on offer at round 5¼d. per lb. and the commercial at 5d. Chlorate of potash has been selling in small quantities at about £27 10s. per ton. There has been a moderate inquiry about in the case of yellow prussiate of potash, values of which range from 6¾d. to 7¼d. per lb., according to quantity.

Sales of arsenic are not extensive, but with supplies on the short side offers keep up at about £20 per ton at the mines for white powdered, Cornish makes. Easiness continues to characterise the sulphate of copper section and individual transactions are relatively small; values range from about £18 to £18 10s. per ton, f.o.b. The lead compounds are on the easy side, with the white and brown acetates at about £32 and £31 per ton, and nitrate at £28 10s. Acetate of lime is in limited request, but at round £12 per ton for the grey material and £7 10s. for the brown, offers are much the same as at last report.

Acids and Tar Products

Acetic acid has not been at all active, and current values are at £35 per ton for the 80 per cent. commercial grade and £49 for the technical glacial. Quotations for citric and tartaric acids are inclined to ease, and there is some uncertainty as to future movements; citric is at about 11¼d. per lb., and tartaric at 10¼d. Oxalic acid is offering at £1 14s. 6d. per cwt., ex store.

Business in the by-products has been restricted, but in most cases values are steady. Pitch is quoted at from £2 2s. 6d. to £2 7s. 6d. per ton, f.o.b., with creosote oil at 3¼d. to 4¼d. per gallon, naked, according to quality. Crude carbolic acid is firm at up to 1s. 4d. per gallon, naked, for 60's, with crystals at about 5¼d. per lb., f.o.b. Solvent naphtha is attracting little buying interest and prices are no better than about 1s. 1½d. per gallon, naked, at works.

Company News

International Nickel Co. of Canada, Ltd.—A quarterly dividend on the common shares is announced of 10 cents, against 15 cents for the previous quarter.

English China Clays, Ltd.—It is announced by the directors that, in view of the continued world-wide depression and the unsettled monetary conditions of various countries affecting the company's trade, they have decided to defer payment of the dividend on the preference shares for the half-year ended June 30, 1931. This is the first time since 1921 that the directors have considered it necessary to postpone payment on the preference shares.

W. and H. M. Goulding.—The report for the year to June 30, 1931, states that the net profits, including dividends from investments and subsidiary companies, and after making provision for discounts on outstanding accounts, amount to £35,250 (against £37,708). This, with £5,450 from last account, leaves £40,700 available for distribution. After providing for debenture interest and fixed dividend on the preference shares, the directors recommend a dividend of 6 per cent. on the ordinary shares for the year; they further recommend that £6,000 be carried to depreciation account, and £4,425 forward.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to August 29, 1931.

Cetamoll.

523,963. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktiengesellschaft (a joint stock company organised under the laws of Germany), Mainzerlandstrasse 28, Frankfort-on-Main, Germany; manufacturers. June 29, 1931.

Hydrodarco.

523,888. Class 2. Chemical substances used for water purification. Darco Sales Corporation (a corporation duly organised under the laws of the State of Delaware), 45, East 42nd Street, New York City, New York, United States of America; manufacturers. June 25, 1931.

Staphar.

523,224. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers. June 2, 1931.

Pyramol.

523,871. Class 4. Raw, or partly prepared, vegetable, animal and mineral substances used in manufactures. Joseph Crosfield and Sons, Ltd., Bank Quay, Warrington; soap manufacturers. June 25, 1931.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

168. (*Lecithin*).—An inquirer is anxious to get into touch with a company which he understands has been formed with a view to manufacturing on a large scale a Lecithin product.

169. (*Gluconic Acid*).—Several inquiries have been received about Gluconic Acid, which was mentioned in The Chemical Age in a recent editorial note on Baking Powder. So far as we can ascertain this acid is not obtainable in this country, but it is made and marketed by Charles Pfizer and Co. Inc., 81, Maiden Lane, New York, U.S.A.

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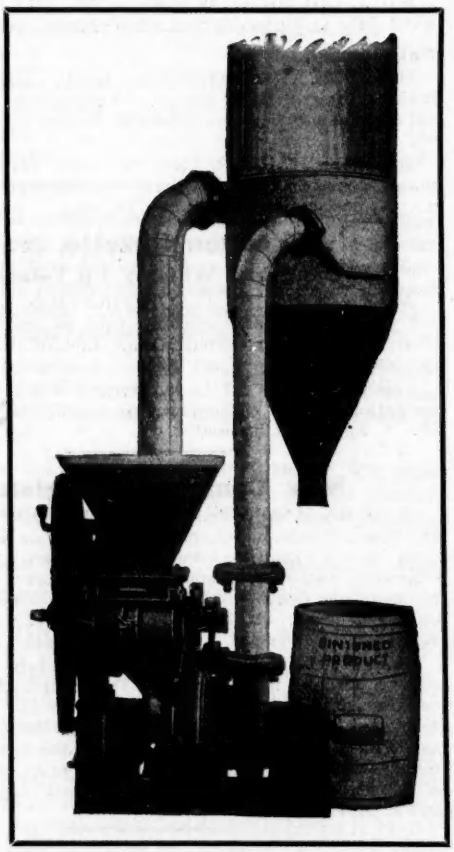

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Its efficiency is established by the ever-increasing number of important manufacturers installing this pulveriser.

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Chemical Matters in Parliament

Tin Mines

In the House of Commons on Wednesday, July 29, Mr. Sinkinson asked the Secretary for Mines the output of tin from the tin mines of Great Britain for the years 1929 and 1930 respectively ?

Mr. Shinwell: The total output of dressed tin ore (*i.e.*, black tin) in Great Britain in 1930 was 4,146 tons, containing, on the average, 60 per cent. of metal. The corresponding figures for 1929 were 5,640 tons and 58 per cent.

Sugar Beet Subsidy

On the order for the third reading of the Consolidated Fund (Appropriation) Bill in the House of Commons on Friday, July 31, Sir H. Samuel (Darwen) raised the subject of the subsidies to the sugar beet industry. He said the Bill included a sum of £2,375,000 as a subsidy to sugar and molasses manufactured from beet grown in this country, including a supplementary sum of £225,000. But these were not the only sums provided in respect of this industry in the course of the year. There had been a very large rebate of taxation on every hundredweight of sugar. The State provided in subsidy 6s. 6d., and in rebate 5s. 10d., making a total of 12s. 4d. per cwt. As the bulk of the sugar last year brought in only 12s., the arrangement seemed somewhat extravagant.

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

South Africa.—The South African Railways and Harbours Administration is calling for tenders to be presented in Johannesburg by September 28 for the supply of 69 tons of leadless white paint in paste. (Ref. B.X. 7,126.)

South Africa.—The South African Railways and Harbours Administration is inviting tenders, to be presented in Johannesburg by September 14, for the supply of approximately 21,700 imperial gallons of disinfectant fluid. (Ref. F.X. 1218.)

Canada.—A manufacturers' agent established at Toronto is prepared to undertake the representation of British primary producers of castor oil of first and second pressure, principally for industrial purposes. The agency would cover the whole Dominion and would preferably be on a commission basis, though the agent is prepared to sell a small quantity on consignment. (Ref. No. 112.)

Jamaica.—The Officer-in-Charge of H.M. Trade Commissioner's Office in Jamaica reports that a local company is desirous of being placed in touch with British manufacturers of:—(1) Equipment for the manufacture of Salt Glazed Clay Pipes. (2) Colour and glazing material for the glazing of salt glazed clay pipes, and also glazed clay tiles. (3) Materials and equipment for glazing, in various colours, concrete articles. (Ref. A.X. 11,050.)

Tariff Changes

Hungary.—Modifications in the Hungarian Tariff resulting from the provisional enforcement as from July 28, of the Commercial Treaty signed between Austria and Hungary, include an import duty of 3 gold kr. per 100 kilos. on chrome alum (hitherto free), and 21 gold kr. per 100 kilos. on Turkey-red oil (hitherto 15 gold kr.). Hydrogen peroxide can now be imported free up to a concentration of 35 per cent.

Yugoslavia.—Alterations in the Yugoslav Tariff, resulting from a commercial treaty between Austria and Yugoslavia, taking effect from July 19, increase the import duty on liquid carbonic acid from 12·50 to 15 gold dinars per 100 kilos.

Alleged Infringement of Artificial Silk Patents

The Press Association has been informed by British Celanese, Ltd., that writs have been issued by that company against Courtaulds, Ltd., and against the Cellulose Acetate Silk Co., Ltd., of Lancaster, for alleged infringement of certain patents for making cellulose acetate artificial silk.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ALLIANCE ARTIFICIAL SILK, LTD., Oulton Broad. (M., 8/8/31.) Registered July 24, £475 debentures, part of £113,000; charged on property at Oulton Broad, also general charge. *Nil. April 8, 1930.

HULL CHEMICAL WORKS, LTD. (M., 8/8/31.) Registered July 24, £3,000 (not ex.) debentures; general charge.

Satisfactions

HICKSON AND PARTNERS, LTD., Castleford, chemical manufacturers. (M.S., 8/8/31.) Satisfactions registered July 22, all moneys, etc. (and collateral charge), registered October 13, 1926.

MOORE (CHARLES) AND CO., LTD., Liverpool, chemical manufacturers. (M.S., 8/8/31.) Satisfaction registered July 23, £13,000, registered January 12, 1915.

London Gazette, &c.

Companies Winding Up Voluntarily

ACETATE PRODUCTS CORPORATION, LTD. (C.W.U.V. 8/8/31.) By special resolution. July 20, Sir William Henry Peat, K.B.E., 11, Ironmonger Lane, London, E.C.2, appointed liquidator.

STEAROLENE, LTD. (C.W.U.V., 8/8/31.) By special resolution. Mr. F. W. Gasston, 31–33, High Holborn, London, W.C.1, appointed liquidator.

New Companies Registered

MODERN INDUSTRIAL DEVELOPMENT, LTD., 5, Hill Road, Mitcham.—Registered August 1. Nominal capital, £100 in 1s. shares. Consulting industrial chemists and engineers, analytical chemists, manufacturers of and dealers in chemicals, drugs, medicaments, pharmaceutical chemicals, etc. Directors: T. Timms, F. G. Cowell, D. C. Polden, K. S. Low.

PYBUS BROS., LTD.—Registered July 29. Nominal capital £10,000 in £1 shares. To acquire the business of candle manufacturers now carried on by R. H. Pybus and E. M. Pybus at Friar Gate, Derby, and at Barton Hill, Bristol, as "Pybus Brothers," and to carry on the business of candle manufacturers, soap manufacturers, chemists, etc. Directors: R. H. Pybus, The Alders, London Road, Alvaston, Derby; and E. M. Pybus.

Co-operation in Electrical Precipitation Activities

The tendency for world-wide co-operation which is developing in an ever-increasing measure for engineering activities has lately manifested itself in the field of electrical cleaning of gases and air. In America the International Precipitation Co. and the Research Corporation made great strides in this work, and they have always had a very clear conception of the necessity for exchanging experience with operators in other countries. On the continent of Europe, the Lurgi Apparatebau Gesellschaft and Siemens-Schuckert Werke gradually acquired the whole of the field, whereas Lodge-Cottrell Ltd., of Birmingham and London, have operated inside the British Empire, developing the art on the basis of the original ideas and patents of Sir Oliver Lodge. As a result of recent negotiations an agreement has therefore been entered into between the above-mentioned firms whereby they have resolved to exchange all patents and experience and to support each other in every possible way with a view to bringing the art of electrical precipitation to its fullest perfection.